

Docket No. HOE96/F319CON

PATENT

**AMENDMENTS TO THE CLAIMS**

Claim 1. (cancelled)

Claim 2. (currently amended) A The process as claimed in claim 1 for preparing an organically modified aerogel, which comprises

- a) introducing a hydrogel formed at pH greater than 3 as initial charge,
- b) modifying the surface of the hydrogel obtained in step a) by mixing the hydrogel with hydrophobing agent to form a hydrophobic surface modified gel, and
- c) drying the surface-modified gel obtained in step b).

wherein a silicatic hydrogel is introduced as initial charge in step a).

Claim 3. (previously presented) A process for preparing an organically modified aerogel, which comprises:

- a) forming a silicatic hydrogel at  $\text{pH} \geq 3$ ;
- b) subjecting the silicatic hydrogel formed in step a), optionally after intermediate treatment steps, to surface modification by mixing the hydrogel with hydrophobing agent to form a surface modified gel; and
- c) drying the surface modified gel obtained in step b), optionally after additional treatment steps,

wherein the silicatic hydrogel is prepared by bringing an aqueous waterglass solution to a  $\text{pH} \leq 3$  with the aid of an acidic ion exchanger resin or a mineral acid, and polycondensing the resulting silicic acid by addition of a base to form an  $\text{SiO}_2$  gel.

Claim 4. (original) The process as claimed in claim 2, wherein the silicatic hydrogel introduced as initial charge in step a) is prepared by obtaining it from an aqueous waterglass solution with the aid of at least one organic and/or inorganic acid via the intermediate stage of a silica sol.

Docket No. HOE96/F319CON

PATENT

Claim 5. (cancelled)

Claim 6. (previously presented) The process as claimed in claim 2, wherein additives are added before and/or during the preparation of the gel.

Claim 7. (original) The process as claimed in claim 6, wherein additives added are opacifiers and/or fibers.

Claims 8 - 55. (cancelled)

Claim 56. (currently amended) AThe process for producing an organically modified lyogel, which comprises: according to claim 54 or 55,

- a) forming a hydrogel at pH > 3;
- b) surface modifying the hydrogel formed in step a), optionally after intermediate treatment steps, by mixing the hydrogel with hydrophobing agent to form a hydrophobic surface modified gel; and
- c) optionally after additional treatment steps, drying the surface modified gel obtained in step b),

wherein the hydrogel is formed in step a) by lowering the pH of an aqueous waterglass solution.

Claim 57. (currently amended) AThe process for producing an organically modified lyogel, which comprises: according to claim 55,

- a) forming a hydrogel at pH between pH 3 and pH 8;
- b) surface modifying the hydrogel formed in step a), optionally after intermediate treatment steps, by mixing the hydrogel with hydrophobing agent to form a hydrophobic surface modified gel; and
- c) optionally after additional treatment steps, drying the surface modified gel obtained in step b), wherein the hydrogel is formed in step a) at pH between pH 3 and pH 8 and

Docket No. HOE96/F319CON

PATENT

wherein the pH of an aqueous waterglass solution is lowered in step a) to a pH value not less than 3.

Claim 58. (previously presented) The process according to claim 57 wherein a) a hydrogel is formed by lowering the pH of an aqueous waterglass solution by addition of acid to  $\text{pH} \geq 8$  and establishing the pH between pH 3 and pH 8; b) the hydrogel formed in step a) optionally after intermediate treatment steps, is subjected to surface modification by mixing the hydrogel with hydrophobing agent to form a surface modified gel; and c) the surface modified gel obtained in step b), optionally after additional treatment steps, is dried.

Claim 59. (currently amended) AThe process for producing an organically modified lyogel, which comprises:according to claim 54 or 55,

- a) forming a hydrogel at  $\text{pH} > 3$ ;
- b) surface modifying the hydrogel formed in step a), optionally after intermediate treatment steps, by mixing the hydrogel with hydrophobing agent to form a hydrophobic surface modified gel; and
- c) optionally after additional treatment steps, drying the surface modified gel obtained in step b).

wherein the hydrogel is formed in step a) by addition of acid to aqueous waterglass solution and without subsequent addition of base in step a).

Claims 60-61 (Cancelled)

Claim 62. (previously presented) A process for producing an organically modified aerogel, which comprises:

- a) forming a hydrogel at  $\text{pH} > 3$ ;
- b) surface modifying the hydrogel formed in step a), optionally after intermediate treatment steps, by mixing the hydrogel with hydrophobing agent to form a surface modified gel; and

Docket No. HOE96/F319CON

PATENT

c) optionally after additional treatment steps, drying the surface modified gel obtained in step b);  
wherein steps a) and b) are carried out as a semi-continuous process, wherein a continuous or semi-continuous stream of acid is mixed with a continuous or semi-continuous stream of aqueous waterglass solution.

Claim 63. (previously presented) The process according to claim 62, wherein the acid stream is admixed with the aqueous waterglass solution through a mixing nozzle.

Claim 64-66. (Cancelled)

Claim 67. (previously presented) The process for producing an organically modified aerogels according to claim 62, wherein the hydrogel is formed in step a) at pH between pH 3 and pH 8.

Claim 68. (previously presented) A process for producing an organically modified aerogels, wherein:

- a) a hydrogel is formed at  $\text{pH} \geq 3$ ;
  - b) the hydrogel formed in step a), optionally after intermediate treatment steps, is subjected to surface modification by mixing the hydrogel with hydrophobing agent to form a surface modified gel; and
  - c) the surface modified gel obtained in step b), optionally after additional treatment steps, is dried;
- wherein step a) and b) are carried out as a continuous process and a continuous or semi-continuous stream of acid is mixed with a continuous or semi-continuous stream of aqueous waterglass solution.

Claim 69. (previously presented) The process according to claim 68, wherein the hydrogel is formed in step a) at pH between pH 3 and pH 8.

Docket No. HOE96/F319CON

PATENT

Claim 70. (cancelled)

Claim 71. (previously presented) The process of claim 3 further comprising washing the gel with water to free it from any electrolyte.

Claims 72-75. (cancelled)

Claim 76. (new) A process for preparing an organically modified aerogel, which comprises:

- a) introducing an inorganic hydrogel formed at pH greater than 3 as initial charge,
- b) modifying the surface of the hydrogel obtained in step a) by mixing the hydrogel with hydrophobing agent to form a hydrophobic surface modified gel, and
- c) drying the surface-modified gel obtained in step b).

Claim 77. (new) The process according to claim 76, wherein the hydrogel obtained in step a) is aged before being surface-modified in step b).

Claim 78. (new) The process according to claim 76, wherein the hydrogel obtained in step b) is subjected to surface silylation using a silylating agent.

Claim 79. (new) The process as claimed in claim 78, wherein the silylating agent is used in liquid form and/or as a gas or vapor.

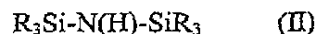
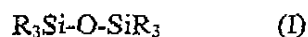
Claim 80. (new) The process as claimed in claim 78 or 79, wherein the silylating agent employed comprises at least one silane of the formula  $R^1_{4-n}SiCl_n$  or  $R^1_{4-n}Si(OR^2)_n$  where  $n = 1$  to 4 and where  $R^1$  and  $R^2$  independently of one another are identical or different and are each a hydrogen atom or a nonreactive, organic, linear, branched, cyclic, saturated or unsaturated, aromatic or heteroaromatic radical.

Docket No. HOE96/F319CON

PATENT

Claim 81. (new) The process as claimed in claim 80, wherein trimethylchlorosilane is employed as silylating agent.

Claim 82. (new) The process as claimed in claim 78 or 79, wherein the silylating agent employed comprises at least one disiloxane of the formula I and/or one disilazane of the formula II



where the radicals independently of one another are identical or different and are each a hydrogen atom or a nonreactive, organic, linear, branched, cyclic, saturated or unsaturated, aromatic or heteroaromatic radical.

Claim 83. (new) The process as claimed in claim 82, wherein the silylating agent employed in step b) is a symmetrical disiloxane.

Claim 84. (new) The process as claimed in claim 82, wherein the silylating agent employed in step b) is disiloxane in which all radicals R are identical.

Claim 85. (new) The process as claimed in claim 82, wherein the silylating agent employed is hexamethyldisiloxane.

Claim 86. (new) The process as claimed in claim 76, wherein at least one acid and/or base is introduced as initial charge in the hydrogel before surface modification.

Claim 87. (new) The process as claimed in claim 86, wherein HCl is used as acid.

Claim 88. (new) The process as claimed in claim 78, wherein the hydrogel is introduced as initial charge in the silylating agent, and then at least one acid and/or base is added.

Docket No. HOE96/F319CON

PATENT

Claim 89. (new) The process as claimed in claim 88, wherein HMDSO is used as silylating agent.

Claim 90. (new) The process as claimed in claim 88 or 89, wherein hydrochloric acid is used as acid.

Claim 91. (new) The process as claimed in claim 76, wherein the agent for surface modification is generated shortly before and/or during the surface modification.

Claim 92. (new) The process as claimed in claim 76, wherein the surface modification is accelerated by means of a catalyst.

Claim 93. (new) The process as claimed in claim 76, wherein at least one carrier gas or carrier gas stream is used in step b) in addition to the agent for surface modification.

Claim 94. (new) The process as claimed in claim 76, wherein some of the water in pores of the hydrogel reacts with the surface modification agent to form a water-insoluble compound.

Claim 95. (new) The process as claimed in claim 94, wherein HMDSO is formed.

Claim 96. (new) The process as claimed in claim 76, wherein an outer surface of the hydrogel is dried prior to surface modification.

Claim 97. (new) The process as claimed in claim 76, wherein the surface-modified gel is washed with a protic or aprotic solvent prior to step c).

Claim 98. (new) The process as claimed in claim 76, wherein the surface-modified gel is washed with a silylating agent prior to step c).

Docket No. HOE96/F319CON

PATENT

Claim 99. (new) The process as claimed in claim 76, wherein the surface-modified gel is subjected to subcritical drying in step c).

Claim 100. (new) The process as claimed in claim 76, wherein the gel obtained in step a) is reacted, prior to silylation, with a solution of a condensable orthosilicate of the formula  $R^1_4-nSi(OR^2)_n$ , where  $n = 2$  to  $4$  and  $R^1$  and  $R^2$  independently of one another are hydrogen atoms or linear or branched  $C_1$ - $C_6$ -alkyl, cyclohexyl or phenyl radicals, or with an aqueous silicic acid solution.

Claim 101. (new) The process as claimed in claim 76, wherein surface modification is carried out in the presence of additives in the hydrogel.

Claim 102. (new) The process as claimed in claim 101, wherein the additives comprise ionic compounds.

Claim 103. (new) The process as claimed in claim 101 or 102, wherein the additives comprise opacifiers.

Claim 104. (new) A process for producing an organically modified lyogel, which comprises  
a) introducing an inorganic hydrogel formed at pH greater than 3 as initial charge, and  
b) subjecting the hydrogel obtained in step (a) to surface modification by mixing the hydrogel with hydrophobing agent to form a surface modified gel.

Claim 105. (new) A process for producing an organically modified lyogel, which comprises:  
a) forming an inorganic hydrogel at  $pH > 3$ ;  
b) surface modifying the hydrogel formed in step a), optionally after intermediate treatment steps, by mixing the hydrogel with hydrophobing agent to form a hydrophobic surface modified gel; and



Docket No. HOE96/F319CON

PATENT

c) optionally after additional treatment steps, drying the surface modified gel obtained in step b).

Claim 106. (new) The process according to claim 105, wherein the hydrogel is formed in step a) at pH between pH 3 and pH 8.

Claim 107. (new) The process according to claim 2 in which the silicatic hydrogel comprises zirconium, aluminum, titanium, vanadium and/or iron compounds.

Claim 108. (new) The process according to claim 76, wherein step a) and b) are carried out as a semi-continuous process.

Claim 109. (new) The process according to claim 76, wherein steps a) and b) are carried out as a continuous process.

Claim 110. (new) The process according to claim 76, wherein step b) results in a hydrophobic gel in a liquid phase substantially immiscible with water, which liquid is separated from an aqueous phase formed by the water from the hydrogel.

Claim 111 (new) The process of claim 91, wherein the agent for surface modification is generated shortly before or during the surface modification by means of an acid.

Claim 112. (new) The process of claim 100, wherein the gel obtained in step a) is reacted, prior to silylation, with a solution of an alkyl or aryl orthosilicate.

Claim 113. (new) The process of claim 102, wherein the additives used comprise NaCl.

Claim 114. (new) The process as claimed in claim 103, wherein the additives used as opacifiers comprise IR opacifiers.

Docket No. HOE96/F319CON

*PATENT*

Claim 115. (new) The process as claimed in claim 76 in which the inorganic hydrogel is a silicatic hydrogel.

Claim 116. (new) The inorganic lyogel as claimed in claim 120 in which the inorganic lyogel is a silicatic lyogel.

Claim 117. (new) The process as claimed in claim 105 in which the inorganic hydrogel is a silicatic hydrogel.

Claim 118. (new) The process of claim 56 wherein the hydrogel is formed in step a) at pH between pH 3 and pH 8.

Claim 119. (new) The process of claim 59 wherein the hydrogel is formed in step a) at pH between pH 3 and pH 8.